some others, very much subdivided in Rodents and other groups* The degree of subdivision and the proportions of the several lobes frequently offer valuable systematic characters. The gall-bladder may be present or absent ; it is always a diverticulum of the hepatic duct. The two are never separate, as in birds, for instance.

Organs of Circulation. — The heart of all mammals is a completely four-chambered organ. In the adult heart there is no communication between the right and left halves. The auricles are comparatively thin- walled, the ventricles thick - walled, in relation to the amount of work that they have severally to perform. The right ventricle, moreover, which has only to drive the blood into the lungs, is much thinner-walled than the left ventricle, which is concerned with the entire systemic circulation. The exits of the arteries and the auriculo- ventricular orifices are guarded by valves, which are so arranged as only to permit the blood to now in the proper direction. But these valves have a morphological as well as a physiological interest. At the origin of each artery, the aorta and the pulmonary, there is a row of three watch-pocket valves, as they have been generally termed on account of their form. These three valves meet accurately in the middle of the lumen of the arterial tube when liquid is poured into them from above, and thus completely occlude the orifice. The auriculo-ventricular valves differ in structure in the two ventricles. That of the left ventricle has only two flaps, and is therefore often spoken of as the bicuspid or mitral valve. Both these flaps are membranous, and together they completely surround the exit from the auricle into the ventricle. The edges of the valve are bound down to the parietes of the heart by numerous branching tendinous threads, the chordae tendineae, which often take their origin from pillar-like muscles arising from the walls of the heart, the so-called musculi papilla res. The valve of the right ventricle is composed of three flaps, and is therefore often spoken of as the tricuspid valve ; it is in the same way membranous, and has chordae tendineae and musculi papillares connected with it. The disposition of the musculi

papillares and their number differ in different mammals, but no exhaustive study has as yet been made of the arrangements in different groups ; the amount of individual variation even is not known, though it is certainly considerable in some cases, for, in-